Impact of the two dimensions of intangibility on the global perceived risk: a segmented approach

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Abstract:

The goal of this paper is double. First of all, we want to test the relationship between the two dimensions of intangibility and the global perceived risk. Moreover, we want to evaluate how service knowledge and the frequency of service utilization affect the perceived level of both physical and mental intangibility, and the relation between those two dimensions and the perceived risk.

Results show that intangibility influences the global perceived risk. But, contrary to the suggestion of Laroche and al (2003), the dimensions of intangibility do not seem to have a simultaneous influence on perceived risk. According to the individuals ' profile, the additional perceived risk will be due either to the mental dimension of intangibility, or to the physical one. The authors largely comment those results, and propose implications both for practitioners and for future researches

Key words : intangibility, perceived risk, segmentation

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INTRODUCTION

Among the characteristics that differentiate services from products, intangibility has been recognized as the most important one (e.g. Zeithaml and Bitner, 2000; Bebko, 2000; Rushton and Carson, 1989; Flipo, 1988), and as the only one which is common to all services (Flipo, 1988).

Service intangibility has been largely studied in the literature. Many researches aimed at clarifying the consequences of intangibility, both for consumers and for services providers, in order to develop relevant marketing strategies and more adequate management tools for services.

The consequences of intangibility for consumers are numerous: without being here exhaustive, we can quote the difficulty for a consumer of evaluating a service before purchase, and sometimes even during and after their consumption (Bateson, 1979; Rushton and Carson, 1989; McDougall and Snetsinger, 1990; Breivik, Troye and Olsson, 1998), the difficulty of discriminating and of choosing between several alternatives (Breivik, Troye and Olsson, 1998), and a increased level of perceived risk compared to the purchase of a tangible good (Bateson, 1979; George and Berry, 1981; Zeithalm, 1981; Levitt, 1981; Güseman, 1981; Flipo, 1984; Finn, 1985; Flipo, 1988; Rushton and Carson, 1989; McDougall and Snetsinger, 1990; Mitchell and Greatorex, 1993; Breivik, Troye and Olsson, 1998; Kurtz and Clow, 1998). We want here to focus more specifically on this last consequence. Indeed, Flipo (1984) suggests that "the level of risk perceived by the purchaser of a service is higher than when this same person buys products. It is obvious that the intangibility of services is the key cause of this perception of a higher level of risk ". George and Berry (1981) suggest that this supplement of perceived risk makes the purchase of a service less pleasant, and that it is essential to set up strategies of risk reduction. Rushton and Carson (1989) even say that intangibility generates an anxiety and a increased level of perceived risk for the consumer, which can easily results in a negative attitude toward the services.

This link between intangibility and an increased level of perceived risk has been presented primarily as a theoretical statement. Moreover, except in a recent study undertaken by Laroche and al. in 2003 (that raise a few questions), the literature does not distinguish the two dimensions of intangibility in their relationship to perceived risk. If intangibility really generates a supplement of risk in the perception of the consumers, is it mainly due to the mental dimension of intangibility, the physical dimension or the two ones? Finally, the literature on perceived risk is unanimous to recognize the need for setting up strategies of risk reduction. So, a better understanding of the nature and the intensity of the relation between mental and physical intangibility and the perceived risk would enable us to develop in a more relevant way specific risk reduction strategies.

The goal of this paper is double. First of all, we want to test the relationship between the two dimensions of intangibility and the global perceived risk. Moreover, we want to evaluate how service knowledge and frequency of service utilization affect the perceived level of both physical and mental intangibility, and the relation between this concept and the perceived risk.

THE CONCEPT OF INTANGIBILITY

The intangibility of services is a central concept in services marketing and yet there does not seem to be a consensus on the definition that should be given to this concept.

Some authors define intangibility as being inaccessibility to the five senses before purchase: "because it is intangible, a service cannot be seen, smelled, heard, touched, nor tasted before being bought" (Cowell 1984; Kurtz and Clow 1998; Kotler 2000; Zeithaml and Bitner 2000). Flipo (1984) extends this meaning to include sensorial inaccessibility even after the service has been bought.

Other authors prefer a more limited description. Shostack (1977) was one of the first to define the concept of intangibility by opposing it to tangibility. As such "tangible" means palpable and material. "Intangible" is an antonym and means thus impalpable and immaterial. In 1988, Flipo revisited the concept of intangibility and also restricted the meaning to touching, considering that the intangible would include the four other senses. By doing this, intangibility becomes a synonym for immateriality.

Bateson (1979) and Berry (1980) give a double meaning to intangibility: on the one hand the impossibility for something intangible to be touched and, on the other hand, the difficulty for it to be defined, formulated or understood mentally in a clear and precise manner. Rushton and Carson (1989) also quite clearly distinguish between what they call physical intangibility and mental intangibility. Mittal (1999) speaks of mental impalpability caused by the complexity or the degree of newness of the service.

As deeply discussed in previous works (Bielen and Sempels, 2003a, 2003b and 2003c), after reviewing the literature and after qualitative interviews with services managers, both French and English speaking, we have proposed the following definition for "intangible" or "intangibility" as used in marketing:

1. a lack of material substance;
2. an increased difficulty in defining, formulating or understanding clearly and precisely.

The measurement scale of intangibility

In recent papers (Bielen and Sempels, 2003a, 2003b and 2003c), we have suggested that intangibility is not a three but a two-dimensional concept. We have distinguished the physical dimension of intangibility from the mental one. Moreover, we have developed a 7 items measurement scale of intangibility, that presents a very good level of psychometric quality (in terms of reliability and validity). Our scale is presented in appendix 1, in its original form in French and in an untested English version. This scale was used in the present research.

THE CONCEPT OF PERCEIVED RISK

In 1960, when Bauer introduced for the first time the concept of perceived risk in marketing, it did not expect to initiate a large amount of researches in consumer behavior. Indeed, many researchers quickly realized that the perceived risk constituted an important explanatory factor of the purchase behavior (Taylor, 1974; Mitchell, 1999).

Bauer (1960, p.23) introduced the concept by stipulating that "*consumer behavior involves risk in a sense that any action of the consumer will produce consequences which it cannot anticipate with anything approximating certainty, and some of which at least are likely to be unpleasant*". As Cunningham (1967) underlines, this definition encompasses a double aspect: on the one hand, the level of uncertainty related to the possible apparition of an event (or the probability of occurrence of an event), and on the other hand, the consequences induced by the effective apparition of this event. Kogan and Wallach (1964) speak about two facets of the perceived risk: one related to the "chance", or the stress is put on the probability, and the other on the danger, which stresses the severity of the negative consequences. In addition, as Ross (1975) points it out, Bauer decides to focus only on the subjective risk (thus perceived), and not on the objective risk. We adopt this same position within the framework of this research.

The large number of researches around the perceived risk have unfortunately not lead to a clear conceptualization of this complex concept. Indeed, Fishoff (1985, in Mallet, 2002) stresses that if one were to read ten different articles on the perceived risk, one should not be surprised to see the risk describes in ten different ways. However, the original conceptualization suggested by Bauer (1960) structured the perceived risk such as it is mainly admitted by the scientific community (Mallet, 2002). This stream recognizes that the perceived risk is based on two components (uncertainty, and negative consequences, called by certain authors: loss or importance of the loss) and that it's a multi-facets concept (physical risk, psychological, social, financial, functional and time related).

The definition of perceived risk finally retained in this research is close to that proposed by Mallet (2002), and in line with the original proposition of Bauer (1960), namely: "*a consumer perceives a risk with regard to the purchase and/or the consumption of a product/service when he/she perceives uncertainty related to the whole set of possible negative consequences of the choice. These consequences can be financial, functional, physical, psychological, social or time-related, to various degree*".

The measurement scale of perceived risk

As suggested by Mallet (2001 and 2002), we have decided to measure the concept of perceived risk by using the scale originally developed by Peter et Tarpey (1975), and revisited by Yavas, Riecken et Babakus in 1993.

This scale is based on the following model :

$$OPR = \sum_{i=1}^{6} (PLi * ILi)$$

Where OPR = Overall perceived risk
PLij = probability of loss i from the purchase
ILij = importance of loss from purchase
I represents the six facets of risk (financial, functional, physical, psychological, social or time related)

The 12 items scale is presented in the appendix 2.

The choice of this scale is not without consequence. In fact, it assumes that consumer perceives different facets of risks, and then he/she recombines those facets to obtain a global perception of risk. Others authors, such as Stone and Gonhaug (1993), have developed a 3 items measurement scale of global perceived risk without any reference to the possible facets of the risk. Therefore, these authors assume that the risk is perceived by the consumer in a global way (regarding the situation of purchase or the specific use of a service), and not in a broken up way, as presupposed by the scale of Peter and Tarpey.

Mallet (2002) has conducted many qualitative interviews with consumers, in order to evaluate how they build in their mind a global score of risk. The results suggest that the individuals perceive risk according several facets, and through an unconscious recombination of those facets, they perceive a global level of risk. It's mainly the reason why we decided to use this selected scale of Peter et Tarpey (1975).

RELATION BETWEEN INTANGIBILITY AND PERCEIVED RISK

The services marketing literature suggests that services are characterized by a higher degree of perceived risk compared to tangible goods, the main reason being the intangible character of services. If empirical studies were indeed undertaken to compare the level of perceived risk of tangible products compared to services (for example Murray and Schlacter, 1990; Mitchell and Greatorex, 1993; Mitra, Reiss and Capella, 1999), we identified only one very recent research aiming at testing the relation between intangibility and perceived risk. Laroche, Bergeron and Goutaland (2003) tried to identify the impact of the intangibility of services on the level of perceived risk. Using their three-dimensional scale of intangibility that they had developed in 2001, and the scale of Stone and Gronhaug (1993) to measure the total perceived risk, they studied the impact of each three dimensions of intangibility on the level of global risk. They concluded that the mental dimension of intangibility (defined according to these authors, in a more sticky way than us) accounts for more variance in the perceived risk than the other two dimensions (physical intangibility and generality). But each dimension has a significant impact on the degree of perceived risk.

Their study is very interesting, because the first one in this field of research. Nevertheless, it raises a few questions:

- first of all, this study is based on the three-dimensional conception of intangibility. As suggested by our previous researches (Bielen and Sempels, 2003a, 2003b and 2003c), we put into question this three dimensional conception because : (1) the "generality" dimension raises remarks regarding its conceptualization. We do not think that the general or specific character of a service is an indicator of its capacity for defining a service, its characteristics or results. As Johnson and Fornell (1987) state, it would rather indicate the level of detail of an offer. (2) the operationalization of this dimension do not seem appropriate. The items chosen for applying the generality dimension do not seem to correspond to its definition, and (3) certain results observed by Laroche et al. (2001) concerning the reliability and convergence validity proper to the generality dimension can be a problem. Cronbach's Alpha for this dimension has a value of 0.61, which is the extreme value when compared with customary recommendations in this area (Nunally 1978; DeVellis 1991). And the average extracted variance is 0.47 for the convergence validity for generality is inferior to Fornell and Larcker's recommendations (1981).

Regarding those remarks and an empirical study presented in our previous papers, we concluded that the two-dimensional model is superior to the three-dimensional one in term of validity. It is therefore interesting to wonder how the results would evolve when using our two-dimensional scale ;

- moreover, the study of Laroche, Bergeron and Goutaland (2003) operationalize the concept of perceived risk using the global risk measurement scale of Stone and Gronhaug (1993) (3 items). We saw that this choice is not without consequence, and that it positions this research in a particular stream, that considers that the consumer perceives risk rather in a global way than in a way specific to certain types of consequences. It is therefore interesting to wonder how results would evolve when considering the other option of the way risk is perceived by consumers, sustained by different authors (Peter et Tarpey (1975), Yavas, Riecken et Babakus (1993), Mallet (2002)).

Regarding these two comments, we think that it would be interesting to undertake a new study testing the relation between physical and mental intangibility on the one hand, and perceived risk on the other hand. This new study is based on our two-dimensional model of intangibility. Moreover, as announced, we apprehend here the perceived risk using the revisited scale of Peter and Tarpey (1975). We thus presuppose that the consumer, regarding a situation of choice, can associate different levels of risk to several types of negative consequences.

SEGMENTATION VARIABLES : KNOWLEDGE AND UTILISATION

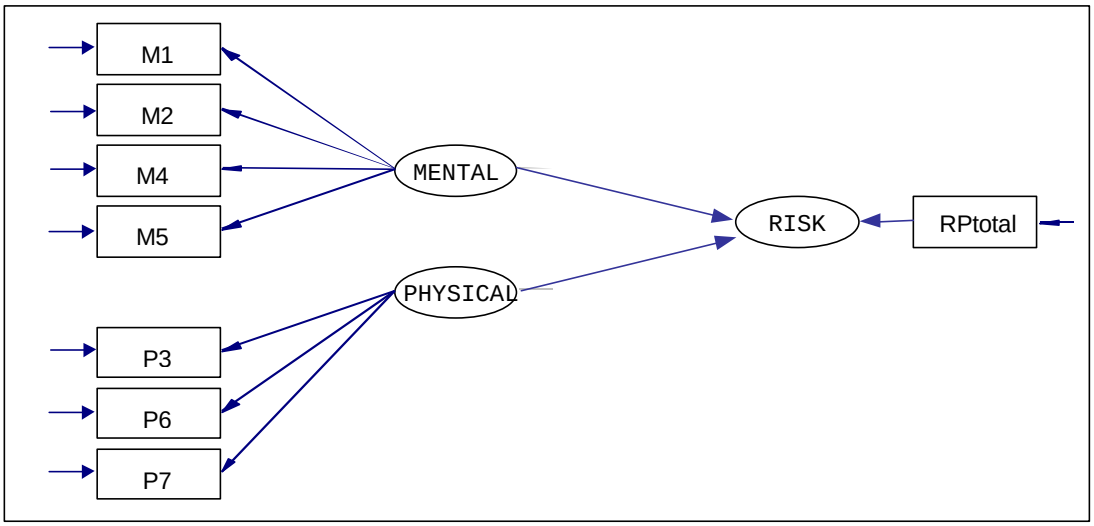
No one will dispute the importance in marketing of the market segmentation. If this step is essential, it is partly because it makes it possible for marketers to meet more adequately the needs of the marketing targets, in order to better building the strategies, developing a valued offering and elaborating an appropriate marketing mix. It is consequently interesting to identify new segmentation criteria that could allow us to refine our understanding of the various profiles of consumers, in order to meet more adequately their needs. And in the vast world of services, the factors being able to influence the level of perceived intangibility appear to us to be an interesting criteria for better understanding these customers.

Several authors suggest that service knowledge is likely to influence both the perceived degree of intangibility and the level of risk associated with this service (Goutaland, 1999; McDougall and Snetsinger, 1990; Murray and Schlacter, 1990; Ward, 1996; Breivik, and Al, 1998; Laroche and Al, 2001; Laroche and Al, 2003).

On the basis of several definitions of knowledge and related concepts (familiarity, expertise, experience) in the literature, as well as the definitions of knowledge and expertise in the dictionary, it appears interesting to us to distinguish two criteria for segmenting our market. On the one hand, a level of knowledge without necessary involving the use of the product or the service, and on the other, hand the level of effective use of the product. It is indeed possible to hold a certain level of knowledge around products or services without being an effective user (e.g. through advertising, through a search of information, a certain level of implication). We consequently distinguish those two possible variables of segmentation, around the concept of knowledge.

To measure these variables, we use a 4 points scale with semantic support, both for knowledge the level of effective utilization. Because we use those variables as segmentation ones, we want to evaluate them by simple mono-item questions.

We propose to test the following model:



We assume the following general statements:

- the two dimensions of intangibility influence positively the global perceived risk;
- the level of service knowledge is inversely correlated to the perceived level of intangibility, on both dimensions;
- the level of service utilization is inversely correlated to the perceived level of intangibility, on both dimensions;
- the level of knowledge and utilization affect the intensity of the relation between intangibility and global perceived risk.

SURVEY

A questionnaire was distributed to 329 persons. The convenience sample is composed of French and Belgian students, of both sexes, from different areas of study (economics, political science, business, engineering), both undergraduate and graduate and belonging to different age groups.

Three services were chosen regarding the expectation of different degrees of physical and mental intangibility. These services are : a consultation to a psychotherapist, an haircut in a hairdresser and the maintenance of a car.

For each service, the respondent was invited to answer initially on the two questions on knowledge and level of utilization. Follows the intangibility scale, then the measurement scale of the perceived risk. On the 329 distributed questionnaires, 276 were collected and encoded, that means a total of 828 applications of the scales. We then eliminated the observations with missing values or meaningless values. We obtain a final database of 780 observations, distributed as follows between the three services: 257 observations for the consultation to the psychotherapist, 274 observations for the haircut and 249 observations for the maintenance of the car. Then, we recomposed the total score of perceived risk for each observation, according to the model described above. Moreover, the normality of data was tested by an analysis according to the values of Skewness and Kurtosis (Kline, 1998).

RESULTS

First step : validation of the measurement model

The first stage of our analysis aims at validating our measurement model of intangibility. As usual, we did a factor analysis of collected data, for the three services as a whole and then for each of them studied individually.

The results of the factor analysis (Table 1) with varimax rotation for all data, confirmed the existence of two factors (eigenvalues superior to 1). The first factor concerning the mental dimension of our proposition contributed 67,93% of the explained variance, the second factor on the physical dimension contributed 18,13%, with a total of 86,06% for the total variance for both factors. Reliability analysis (Cronbach Alpha) gave highly acceptable coefficients of 0.94 and 0.93 respectively for the two factors (Nunally, 1978; De Vellis, 1991).

Table 1 : Results of the factor analysis

	Factor	
	Mental	Physical
M1	,897	
M2	,849	
M4	,886	
M5	,889	
P3		,855
P6		,901
P7		,907
Eigenvalue	4,765	1,269
Explained variance	67,93%	18,13%
Cronbach Alpha	0,94	0,93
Rhô de Jöreskog	0,96	0,91

For each service analyzed individually, we obtain the same kind of results.

To assess the validity of the factor structure, we used a confirmatory factor analysis. The Lisrel 8.50 software (Jöreskog and Sörbom 1993) was used for this. The covariance matrix of indicators was the database for input and the procedure for estimation was the maximum likelihood method.

The table here below indicates the different coefficients of the model, and the indice of adjustement required to evaluate the quality of our measurement model.

Table 2 : Measurement model coefficient

Latent variables	Indicators	Factor loading	Degree of significance for t of Student	R^2
Mental dimension	M1	0,93	0,027	0,87
	M2	0,89	0,028	0,79
	M4	0,93	0,027	0,87
	M5	0,92	0,028	0,84
Physical dimension	P3	0,98	0,028	0,96
	P6	0,91	0,029	0,83
	P7	0,73	0,038	0,53

Table 3 : Adjustment Indices for the measurement model

Absolutes Indices	Value	Incremental Indices	Value	Parsimony Indices	Value
GFI	0,99 > 0,9	NFI	0,99 > 0,9	? ² normalized	3,31
AGFI	0,97> 0,9	IFI	0,99 > 0,9	ECVI	
Critical N	518,96 > 200	CFI	0,99 > 0,9	PNFI	0,088
RMR	0,007			PGFI	0,473
RMSEA	0,054 < 0,08				0,353

This table shows a highly acceptable quality of adjustment even if the key values of indices should be considered as relative rather than absolute (Roussel et al., 2002).

We need also to check the reliability and the validity of our measurement model. The reliability is guarantied after the inspection of the Cronbach Alpha and the Rhô of Joreskog (see table 1). Moreover, the following data's allow us to evaluate the convergent validity:

Table 4: Convergent validity validation

Dimension	Nbr of ? non significant to 0.05	Nbr de R^2 associated inferior to 0.5	? (vc)
Mentale	0	0	0,84
Physique	0	0	0,77

The convergent validity is checked by the following conditions (Roussel et al., 2002, p.56):

- The test t associated with each factor loading is significant, that is superior to 1.96. This is verified for each of our 7 indicators (see Table 3 with the level of signification of t of Student < 0.05).
- Each indicator must share more variance with its construct than with the margin for error that is associated with it. This is also true for all the 7 indicators (see Table 3: the square of all factor loadings for indicators is > 0.5).
- We can associate the criteria of average extracted variance or the rhô of convergent validity in Fornell and Larcker (1981). The convergent validity is established if the value for each factor is at least 0.50 of the total variance. This condition is verified for both factors, as shown in the table 4, which summarizes the 3 conditions for convergent validity.

Discriminant validity is also assessed by comparing the average extracted variance of each latent variable with the squared correlation shared with other latent variables (Fornell and Larcker 1981). This must be lower than the values corresponding to extracted variances. The square of the correlation between the two latent variables - equal to 0.46, is well under the two corresponding extracted average variances in the Table 4 (? (vc)).

As a final analysis, we want to ensure of the stability of the measurement model across the three services separately. So we realize a multi-groups analysis under Lisrel. Each of the three groups is related to one of the three services. Using a test of difference of Chi-Deux, this analysis enabled us to conclude to the stability of the measurement model across all the studied services. In other words, the model of measurement preserves its quality of adjustment independently of the studied services.

We can consequently validate our measurement model. So we can now perform the analysis of the structural model.

Second step : Analysis of the structural model

We should now test the structural model, that means the relations between physical and mental intangibility on the one hand, and global perceived risk on the other hand (model presented above).

The major conclusion of this analysis is that only mental intangibility has a significant effect on the total perceived risk (see table 5). This conclusion is very interesting, because the literature always presented in a theoretical way that the intangibility of services is one of the main causes of a higher degree of perceived risk for services compared to tangible products. It is thus now possible for us to moderate this theoretical statement: only mental intangibility seems to affect significantly the level of perceived risk by the consumer.

The inspection of table 6 suggests that our model is consistent with the data.

Table 5 : Relation between mental and physical intangibility and global perceived risk

	Factor loading	T de Student
MENTAL ⇑ RISK	0,14	2,70
PHYSIQUE ⇑ RISK	0,09	1,79 *

* Not significant at the level of 1,96

Table 6 : Adjustment Indices for structural model

Absolutes Indices	Value	Incremental Indices	Value	Parsimony Indices	Value
GFI	0,99 > 0,9	NFI	0,99 > 0,9	? ² normalized	3,08
AGFI	0,97> 0,9	IFI	0,99 > 0,9	ECVI	
Critical N	496,13 > 200	CFI	0,99 > 0,9	PNFI	0,112
RMR	0,0144			PGFI	0,496
RMSEA	0,052 < 0,08				0,384

Third step : Analyze the impact of knowledge on intangibility and on the relation between intangibility and perceived risk

We started by testing the stability of our measurement model of intangibility, through a factorial analysis initially, using the structural modeling equations then. In order to obtain sufficient sizes of samples per category, we have regrouped the 4 classes in 2 categories: low level of knowledge (combination of "I don't know anything about this service" and "I have a moderate knowledge of what is this service" - size: 457 observations) and high level of knowledge (class "I have a good knowledge of what is this service" and "I am an expert in this field" - size: 323 observations). The factor analysis confirms the two-dimensional structure for each category, with the indicators correctly charged in their respective dimension. In the same way, Cronbach Alpha is very good for each dimension and each category separately. In the second time, the measurement model was tested under Lisrel software, through a multi-groups analysis (2 groups, one by level of knowledge). The test of difference of Chi-deux between the free model and the constrained model leads us to accept

the assumption of absence of difference between the 2 models. We can consequently conclude that our measurement model is stable through these two levels of knowledge.

Then, we tested the impact of knowledge on the degree of physical and mental intangibility using a test of means comparison. Precisely, for each observation of our database, we recomposed the physical and the mental score of intangibility. Then we computed the mean and the standard deviation of our two dimensions, service per service, for the group " low level knowledge " and for the group " high level of knowledge ". We finally carried out the test of means comparison. The results are presented in the two following tables:

CONSULTATION TO A PSYCHOLOGIST		
MENTAL INTANGIBILITY	**Low level of knowledge**	**High level of knowledge**
Mean	4,64	3,40
Standard deviation	1,30	0,99
Size of sample	232	25
Z-value and (p-value)	5,751 (0,00)	
PHYSICAL INTANGIBILITY	**Low level of knowledge**	**High level of knowledge**
Mean	5,48	4,71
Standard deviation	0,97	0,87
Size of sample	232	25
Z-value and (p-value)	4,210 (0,00)	

HAIRCUT		
MENTAL INTANGIBILITY	**Low level of knowledge**	**High level of knowledge**
Mean	2,06	1,71
Standard deviation	0,95	0,59
Size of sample	73	201
Z-value and (p-value)	2,966 (0,00)	
PHYSICAL INTANGIBILITY	**Low level of knowledge**	**High level of knowledge**
Mean	2,62	2,31
Standard deviation	1,18	1,03
Size of sample	73	201
Z-value and (p-value)	1,987 (0,044)	

MAINTENANCE OF A CAR		
MENTAL INTANGIBILITY	**Low level of knowledge**	**High level of knowledge**
Mean	3,68	2,48
Standard deviation	1,24	0,94
Size of sample	152	97
Z-value and (p-value)	8,655 (0,00)	
PHYSICAL INTANGIBILITY	**Low level of knowledge**	**High level of knowledge**
Mean	3,45	2,67
Standard deviation	1,27	1,16
Size of sample	152	97
Z-value and (p-value)	4,985 (0,00)	

The analyze of those tables allows us to suggest the following conclusion: for each service, the level of knowledge seems to have a significant impact both on the perception of mental intangibility and on the physical one. The difference of means between the score of mental and physical intangibility of the group "low level of knowledge" and the group " high level of knowledge " is significant. The level of knowledge is inversely correlated with the score of

mental and physical intangibility. The more a person is knowledgeable with a service, the less he/she perceives this service as being intangible, on both dimensions.

The relation between knowledge and mental intangibility is rather intuitive. Knowledge indeed relates to faculty to know, to grasp an entity. Mental intangibility makes reference to an increased difficulty in defining, formulating or understanding clearly and precisely. It is therefore rather logical that a higher level of knowledge facilitates this work of defining, explaining or understanding. More unexpected is the conclusion on the impact of knowledge on the physical level of intangibility. Thus, the results tend to show that the more expert you are regarding a service, the more you perceive it as presenting a higher degree of materiality.

Finally, we want to test the impact of knowledge on the relation between intangibility and perceived risk.
For remind, the test of the structural model on the total sample led us to conclude with a significant impact of mental intangibility on the perceived risk, but a insignificant relation between physical intangibility and perceived risk. We want at this stage to analyze this relation on the one hand with the group of the individuals having a low level of knowledge, and on the other hand the group of the individuals having a high knowledge of the analyzed services. We obtain the following conclusions (adjustment of each model having obviously been controlled):

- For the group "low level of knowledge", the conclusions remain unchanged. Only the mental dimension of intangibility presents a significant effect on the perception of total risk (loading of 0,16, T-value of 2,75). The physical dimension presents a insignificant impact again (loading of 0,10 and T-value of 1,76).
- For the group "high level of knowledge", the conclusions are basically modified. Only the physical dimension shows a significant impact on the level of perceived risk (loading of 0,15 and T-value of 2,07 versus a loading of 0,06 and a T-value of 0,84 for mental dimension).

Fourth step : Analyze the impact of utilization on intangibility and on the relation between intangibility and perceived risk

In the same way than described above, we first tested the stability of the measurement model between the group "infrequent users" and "frequent users". Again, we carried out a classes regrouping to reach a sufficient size of sample per category (566 observations for the category of the infrequent users, and 214 observations for the "frequent users"). Classically, we then conduct a factor analysis under SPSS, then a multi-groups analysis under Lisrel. The results allow us to conclude that our measurement model is stable between the two levels of utilization of the studied services.

We carried out the same analysis than for knowledge, to test the impact of the level of utilization on the degree of intangibility. The results are presents here after:

CONSULTATION TO A PSYCHOLOGIST		
MENTAL INTANGIBILITY	**Infrequent user**	**Frequent user**
Mean	4,58	3,02
Standard deviation	1,30	0,80
Size of sample	246	11
Z-value and (p-value)	6,116 (0,00)	

PHYSICAL INTANGIBILITY	Infrequent user	Frequent user
Mean	5,45	4,53
Standard deviation	0,98	0,61
Size of sample	246	11
Z-value and (p-value)	4,736 (0,00)	

HAIRCUT		
MENTAL INTANGIBILITY	**Infrequent user**	**Frequent user**
Mean	1,87	1,73
Standard deviation	0,81	0,59
Size of sample	142	132
Z-value and (p-value)	1,643 (0,097)	
PHYSICAL INTANGIBILITY	**Infrequent user**	**Frequent user**
Mean	2,37	2,42
Standard deviation	1,18	1,06
Size of sample	142	132
Z-value and (p-value)	-0,369 (0,713)	

MAINTENANCE OF A CAR		
MENTAL INTANGIBILITY	**Infrequent user**	**Frequent user**
Mean	3,46	2,59
Standard deviation	1,27	1,06
Size of sample	178	71
Z-value and (p-value)	5,515 (0,00)	
PHYSICAL INTANGIBILITY	**Infrequent user**	**Frequent user**
Mean	3,34	2,66
Standard deviation	1,30	1,13
Size of sample	178	71
Z-value and (p-value)	4,102 (0,00)	

The conclusions are identical to those formulated for the level of knowledge, namely:

- The level of utilization seems to have a significant impact both on the perception of mental intangibility and the physical one. Let us note however that the means difference is insignificant for the hairdresser. This can be possibly explained by the fact that the two scores of intangibility are already weak for this service. Moreover, the haircut is a service consumed by all, whether carried out by an hairdresser or not.
- The means difference between the score of mental and physical intangibility of the group "infrequent users" and that of the group "frequent users" is significant. The level of use seems to be inversely correlated with the two dimensions of intangibility. The more an individual use the service, the less he/she will perceive it as being mentally and physically intangible.

This conclusion appears rather intuitive, because the utilization probably increase the level of knowledge of the individual with the service. Thus, if knowledge does not imply necessarily the utilization, it is more than probable that the use implies a better level of knowledge. Moreover, if the service is people or equipment based intensive, it's quite logic that its utilization increase the perception of a higher degree of materiality.

Finally, just as done for knowledge, we want to evaluate the impact of the level of utilization on the relation between intangibility (mental and physical) and perceived risk. The conclusions of the analysis are identical to those of the level of knowledge, namely:

- For the group "infrequent users", the conclusions remain also unchanged compared to the results observed with the whole database. Only the mental dimension of intangibility presents a significant effect on the perception of total risk (loading of 0,14, T-value of 2,47). Physical dimension presents a insignificant impact (loading of 0,09 and T-value of 1,63).
- For the group "Frequent users", the conclusions are modified just like for the high level of knowledge. Only the physical dimension has a significant impact on the level of perceived risk (loading of 0,16 and T-value of 2,04 against a loading of 0,08 and a T-value worth of 1,02 for mental dimension). The level of utilization could thus - as for the level of knowledge - modify the intensity of the relation between intangibility and perceived risk. An infrequent user would perceive more risk related to his/her relative difficulty to understand the service, to define or to formulate it precisely. On the other hand, a more frequent user of this service would not perceive this mental anxiety, but it is the relatively immaterial nature of the service that generate for this individual a greater part of risk.

DISCUSSION AND IMPLICATIONS

First of all, we have shown that intangibility influences the global perceived risk. But, contrary to the suggestion of Laroche and al (2003), the two dimensions of intangibility do not seem to have a simultaneous influence on perceived risk. According to the profile of the individuals, the additional perceived risk will be due either to the mental dimension of intangibility, or to the physical one. We could note that if the level of knowledge or use of the service is weak, the mental dimension of intangibility seems to be the only one to have a significant impact on the global perceived risk. However, in case of good level of knowledge or utilization, it is the physical dimension of intangibility which seems to the only one to have a significant influence on the perceived risk.

Among the plausible explanations of these results, we can suggest that the service being by nature relatively immaterial, it exists only through the mental representation that people have about it, helped by the available material supports (Breivik, Troye et Olsson (1998). Since an individual has only a poor knowledge or a low level of use of this service, this mental representation is far from clear, and therefore - according to our results - it probably explains by itself the increased level of perceived risk. On the other hand, the proficient consumer for whom the mental representation is improved, perceives risk by the lack of materiality of the service, and not by the absence of cognitive reference. Consequently, in order to set up effective strategies of reduction of perceived risk, it is important to know to which profile the customer belongs, in order to reduce its mental anxiety or to focus on the physical tangibilisation.

Thus, if a company plan to launch a new unknown service, it appears more important firstly to try to tangibilise this service on its mental side, in order to reduce the perceived risk. With a "novice" customer of an existing service, it would be more interesting to set up strategies of risk reduction while trying to reduce his/her mental "anxiety". Inversely, because the "experts" partly perceive risk because of a degree of immateriality of the services it would be more relevant to develop strategies of physical tangibilisation, in order to contribute to reduce their level of perceived risk. Consequently, the implementation of the service tangibilisation

strategies is not without consequences on the possible reaction of the various profiles of consumers. And in an interpersonal encounter for example, the service provider would have an advantage to identify the degree of knowledge of its customer/prospective customer using skilful filters questions in order to act adequately on the reduction of its perceived risk.

LIMITATIONS AND FUTURE RESEARCH NEEDS

This research does have some limitations, which can be opportunities for future research:

- first of all, the choice of the a sample from a population of students, while customary and convenient is limited as to representativity. The same study could be made with a sample of actual or potential consumers, for the chosen products and services;
- secondly, the choice of services for our research was both heterogamous on the continuum of physical and mental intangibility. The number and variety of products and services examined could be increased and the results compared with the ones from our study. Moreover future research should include virtual services such as Internet-based services;
- in the idea of a better understanding of the influence of intangibility on the perceived risk, other segmentation variables than the use and the knowledge of the product could be interesting to identify and to study;
- the existence of a guarantee associated with the service could possibly moderate the relation between intangibility and perceived risk;
- finally, the deliberate use of the scale of Peter et Tarpey (1975) affiliates this research to a particular stream. It should be interesting to conduct a specific research to compare the used scale with the one of Stone and Gronhaug (1993).

REFERENCES

Bateson J.E.G. (1979), Why we need service marketing, dans Ferrell O.C., Brown S.W. et Lamb C.W. (eds.), *Conceptual and theoritical developments in marketing,* American Marketing Association.

Bauer R. (1960), Consumer behaviour as risk taking, in R.S. Hancock, editor, *Dynamic marketing for a changing world*, Proceedings of the 43rd Conference of the American Marketing Association, 389-398.

Bebko C.P. (2000), Service intangibility and its impact on consumer expectations of service quality, *Journal of Services Marketing*, 14, 1, 9-26.

Berry L.L. (1980), Services marketing is different, dans Lovelock C.H. (1984*), Services Marketing*, New Jersey, Prentice-Hall, Englewoods Cliffs, 29-37.

Bielen F. et Sempels C. (2003a), Proposition d'une nouvelle échelle de mesure du degré d'intangibilité d'une offre de services, *Acte du XIXème Congrès International de l'Association Française de Marketing*, 9 et 10 mai, Gammarth, Tunisie.

Bielen F. et Sempels C. (2003b), Critical Analysis of the Dimensionality of the Concept of Intangibility: An Empirical Study, *Acte de l'AMA Servsig Research Conference*, 12-14 Juin, Reims, France.

Bielen F. et Sempels C. (2003c), From a Three-Dimensional to a Two-Dimensional Conceptualisation of Intangibility: a Critical Review, *Paper submitted to Journal of Services Research and currently under reviewing*.

Breivik E., Troye S.V. et Olsson U.H. (1998), Dimensions of product intangibility and their impact on product evaluation, papier de recherche présenté à la Conférence Annuelle de l'Association for Consumer Research, Montréal, Canada.

Cowell D.W., (1984), *The marketing of services,* Heinemann, Londres.

Cunningham S.M. (1967), The major dimensions of perceived risk, in Cox D.F., ed., *Risk taking and information handling in consumer behavior*, Boston, MA, Harvard University Press, 82-108.

De Vellis R.F. (1991), *Scale development : theory and application*, Sage Publication Inc., California.

Finn A. (1985), A theory of the consumer evaluation process for new product concepts, *Research in Consumer Behavior*, 1, 35-65.

Fischoff B. (1985), Managing risk perceptions, *Issue in Science and Technology*, 2, 1, 83-96.

Flipo J.P. (1984), *Le management des entreprises de services*, Les Editions d'Organisation, Paris.

Flipo J.P. (1988), On the intangibility of services, *The Service Industries Journal*, 8, 3, 286-298.

Fornell C. et Larcker D.F. (1981), Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, 18, 39-50.

George W.R. et Berry L.L. (1981), Guidelines for the advertising of services, dans Lovelock C.H. (1984*), Services Marketing*, New Jersey, Prentice-Hall, Englewoods Cliffs, 407-412.

Goutaland C. (1999), *Products and services intangibility: a study of its dimensions and consequences on product/service evaluation*, thesis in the Faculty of Commerce and Administration, Concordia University, Montreal, Quebec, Canada.

Güseman D.S. (1981), Risk perception and risk reduction strategies in consumer services, dans Donelly J.A. et George W.R. (Eds), *Marketing of services*, American Marketing Association, 200-204.

Johnson M.D. et Fornell C. (1987), The nature and methodological implications of the cognitive representation of product, *Journal of Consumer Research*, 14, 214-228Kogan

N. et Wallach M.A. (1964), *Risk taking : a study in cognition and personality*, Holt, Rhinehart et Winston, New York, NY.

Kotler P. (2000), *Marketing management*, Prentice Hall International, New Jersey.

Kurtz D.L. et Clow K.E. (1998), *Services marketing*, John Wiley & Sons, New York.

Laroche M., Bergeron J. et Goutaland C. (2001), A three-dimensional scale of the intangibility, *Journal of Service Research*, 4, 1, 26-38.

Laroche M., Bergeron J. et Goutaland C. (2003), How intangibility affects perceived risk: the moderating role of Knowledge and involvement", Journal of Services Marketing, 17, 2, 122-140.

Levitt T. (1981), Marketing intangible products and product intangible, *Harvard Business Review*, 59, 94–102.Mallet S. (2001), Pour une clarification de la mesure du risque perçu, *Actes du 17ème Congrès International de l'Association française de Marketing*, Deauville, France.

Mallet S. (2002), *Vers une clarification des déterminants du risque perçu et de ses conséquences sur le processus de décision d'achat*, Thèse de doctorat de l'Université de Paris1 -Panthéon Sorbonne, Paris, France.

McDougall G.H.G. et Snetsinger D.W. (1990), The intangibility of services: measurement and competitive perspectives, *Journal of Services Marketing*, 4, 4, 27-40.

Mitchell V.W. (1999), Consumer perceived risk: conceptualisations and models, *European Journal of Marketing*, 33, 1/2, 163-195.

Mitchell V.W. and Greatorex, M. (1993), Risk perception and reduction in the purchase of consumer services, *The Service Industries Journal*, 13, 4, 179-200.

Mitra K., Reiss M.C. et Capella L.M. (1999), An examination of perceived risk, information search and behavioral intentions in search, experience and credences services, *The Journal of Services Marketing*, 13, 3, 208-219.

Mittal B. (1999), The advertising of services : meeting the challenge of intangibility, *Journal of Services Marketing*, 16, 5, 424-431.

Murray K.B. et Schlater J.L. (1990), The impact of services versus good on consumers' assessment of perceived risk and variability, *Academy of Marketing Science*, 18, 1, 51-66.

Nunally J. (1978), *Psychometric theory*, 2ème Edition, McGraw Hill, New York.

Peter J.P. et Tarpey L.X. (1975), A comparative analysis of three consumer decision strategies, *Journal of Consumer Research*, 2, 29-37.

Ross I. (1975), Perceived risk and consumer behavior: a critical review, *Advances in Consumer Research*, 2, 1-20.

Roussel P., Durrieu Fr., Campoy E et El Akremi A. (2002), Méthodes d'équations structurelles : recherche et applications en gestion, Economica, 274 pages.

Rushton A. et Carson D.J. (1989), The marketing of services: managing the intangibles, *European Journal of Marketing*, 23, 8, 23-44.

Shostack L. G. (1977), Breaking free from product marketing, *Journal of Marketing*, 41, 73-80

Stone R.N. et Gronhaug K. (1993), Perceived risk : further considerations for the marketing discipline, *European Journal of Marketing*, 27, 3, 39-50.

Taylor J.W. (1974), The role of risk in consumer behavior, *Journal of Marketing*, 38, 54-60.

Ward T. (1996), Consumer's acquisition of new product knowledge of complex service products. Results of an experiment on the effect of prior product knowledge, *Asia Pacific Advances in Consumer Research*, 2, 47-59.

Yavas U., Riecken G. et Babakus E. (1993), Efficacy of perceived risk as a correlate of reported donation behavior: an empirical analysis, *Journal of the Academy of Marketing Science*, 21, 1, 65-70.

Zeithalm V.A. (1981), How consumer evaluation processes differ between goods and services, in *Marketing of Services*, Donnelly J.H. et George W.R., Chigaco, American Marketing, 186-190.

Zeithaml V.A. et Bitner M.J. (2000), *Services marketing : integrating customer focus across the firms*, New York, McGraw-Hill.

APPENDIX 1 : THE MEASUREMENT SCALE OF INTANGIBILITY

Original version of the scale in French

M1: Je suis en mesure d'expliquer à un ami ce qu'est item 1= avec beaucoup de facilité à 7=avec beaucoup de difficulté
M2: Item évoque pour moi quelque chose 1=de très simple à 7=de très compliqué
P3: Item évoque pour moi quelque chose 1=qui est très facile à voir et à toucher à 7=qui est très difficile à voir et à toucher
M4: Je comprends ce qu'est item 1=très facilement à 7=très difficilement
M5: Je suis en mesure de définir ce qu'est item 1=en étant très précis à 7=en étant très flou
P6: Item évoque pour moi quelque chose 1=de totalement palpable à 7=de totalement impalpable
P7: Je perçois item comme étant 1=exclusivement matériel à 7=exclusivement immatériel

Untested translated version of the scale in English (translated by a native American person fluent in French)

M1: I am able to explain to a friend what the item is 1 = very easily to 7 = very difficultly
M2: The item makes me think of something 1 = very simple to 7 = very complicated
P3: The item makes me think of something 1 = which is very easy to see and to touch to 7 = which is very difficult to see and to touch
M4: I understand what the item is 1 = very easily to 7 = very difficultly
M5: I am able to define what the item is 1 = very precisely to 7 = very vaguely
P6: The item makes me think of something 1 = completely palpable to 7 = completely impalpable
P7: I consider the item to be 1 = exclusively material to 7 = exclusively immaterial

APPENDIX 2 : THE MEASUREMENT SCALE OF PERCEIVED RISK

Original version used in the research (in French)

L'échelle se présente comme suit :

- Pour mesurer la probabilité d'occurrence des conséquences négatives, les répondants sont invités à répondre à la question "Selon vous, quelle est la probabilité pour que l'achat de … entraîne les conséquences suivantes ?" sur une échelle bipolaire à 5 points, allant de "très peu probable" à "fortement probable".
- Pour mesurer l'importance des conséquences négatives, la question "Indiquez maintenant d'une croix l'importance que vous accorderiez à chacune de ces conséquences si elles se produisaient" est proposée aux répondants sur une échelle bipolaire à 5 points, allant de "Ce n'est pas du tout important" à "C'est extrêmement important.

Chaque facette du risque (les conséquences) est opérationalisée par les items suivants :

Facettes du risque	Items
Physique	L'utilisation (ou la consommation) de … peut être dangereux pour la santé
Fonctionnel	La qualité de … peut se révéler non conforme à mes attentes
Financier	L'achat d'un … peut représenter une mauvaise dépense *(=perte d'argent en cas de mauvais fonctionnement, dépense plus coûteuse que prévue, existence d'un modèle équivalent à prix plus bas)*
Psychologique	L'achat d'un … peut entraîner une déception vis-à-vis de moi-même *(possibilité d'être déçu de soi à cause d'un mauvais choix)*
Social	Le … que l'on achète peut donner une mauvaise image de soi à son entourage
Temporel	L'achat et/ou l'utilisation d'un … peut me faire perdre du temps

Untested translated version of the scale in English

- To measure the probability of the occurrence of a negative event, respondents are asked to answer to the following question : "According to you, what is the probability that the purchase of … involves the following consequences?" on a 5 point scale, from "Very little probability" to "Strong probability"
- The measure the importance of negatives consequences, we use the following question "Could you please evaluate the importance of each of those consequences if they would occur when purchasing …" on a 5 point scale from "This is absolutely unimportant" to "It's extremely important".

Each facet of risk is operationalized by the following items:

Facets	Items
Physical	The use (or the consumption) of … may be dangerous for my health
Functional	The quality of … may not be conform to my expectations
Financial	The purchase of … may be a bad way of spending my money (because … doesn't perform as it should do, because it's more costly than foreseen, because of the existence of a similar model at a lower price, …)
Psychological	The purchase of … can involve a disappointment with respect to myself (possibility of being disappointed of myself because of a bad choice)
Social	The purchase of … can give a bad image of myself to my relation
Time related	The purchase/the use of … can make me losing time